

IN THE CLAIMS:

1 – 15 (canceled)

16. (currently amended) A coil and specimen positioning system ~~for~~ easily positioning a non-human laboratory specimen in a predetermined position within a sweet spot of an imaging field in a bore of an MRI imaging machine and through a bore of a gradient coil located concentrically ~~in~~ about the bore of the MRI imaging machine, said coil and specimen positioning system comprising:

an integrated coil positioning assembly comprising a first pair of support members insertable within ~~said~~ the bore of ~~said~~ the MRI imaging machine and through the bore of the gradient coil, said coil positioning as assembly having an aperture ~~for axial~~ axially receiving passage of ~~said~~ the specimen and having a first abutment surface engageable with the MRI imaging machine and a second abutment surface axially locating the specimen in the bore of the MRI imaging machine;

a specimen positioning assembly comprising a specimen retention device configured to ~~pass~~ fix the specimen in position and insertable through the aperture of said integrated coil positioning assembly, and a second pair of support members insertable within said first pair of support members on said integrated coil positioning assembly, and a third abutment surface axially locating the specimen in the bore of the imaging machine; and

an axially-extending interconnection provided between said first and second pairs of support members, said interconnection locating ~~said~~ the specimen

positioning assembly concentrically within ~~said~~the bore of ~~said~~the imaging machine and concentrically within the bore of ~~said~~the gradient coil[.]; and

wherein axial insertion of said specimen positioning assembly into said integrated coil positioning assembly abuts said second and third abutment surfaces and thereby positions the specimen accurately and repeatably in the sweet spot within the imaging field.

17. (currently amended) The system of claim 16, wherein said ~~sliding~~ interconnection comprises a pair of rods and a pair of grooved rails.

18. (currently amended) The system of claim 16, wherein said ~~sliding~~ interconnection comprises a self-centering interconnection.

19. (currently amended) The system of claim 16, further comprising a mounting member ~~fixed~~fixable to ~~said~~the MRI imaging machine, and wherein said first pair of support members is connected to said mounting member, and wherein said specimen positioning assembly is freely insertable into said mounting member and freely removable therefrom.

20. (currently amended) The system of claim 16, wherein said specimen positioning assembly comprises an ~~engagement member~~end plate defining said third abutment surface and for limiting insertion of said specimen positioning assembly into said MRI imaging machine.

21. (canceled)

22. (new) A specimen positioning system insertable within an axial bore of an imaging machine having an imaging field with a sweet spot, said system easily, accurately and repeatably positioning a non-human laboratory specimen in the sweet spot, said system comprising:

a positioning assembly comprising;

at least a first pair of support members insertable within the axial bore of the imaging machine;

a first mounting member coupled to said first pair of support members and having a first abutment surface engageable with the imaging machine such that said positioning assembly is axially, radially and circumferentially positioned with respect to the axial bore of the imaging machine;

a radially-extending second abutment surface provided on said positioning assembly; and

said positioning assembly having an aperture receiving axial passage of the specimen into the axial bore of the imaging machine;

a specimen positioning assembly comprising;

at least a second pair of support members axially movable along said first pair of support members on said positioning assembly;

a retention device provided on said specimen positioning assembly and configured to pass through the aperture of said positioning assembly and secure the specimen in a fixed axial position;

a radially-extending third abutment surface provided on said specimen positioning assembly and engageable with said second abutment surface on said integrated positioning assembly; and

an axially-extending interconnection provided between said first and second pairs of support members, said interconnection locating and supporting said specimen positioning assembly within the bore of the imaging machine and within the positioning assembly; and

wherein axial insertion of said specimen positioning assembly through the aperture of said positioning assembly and along said axially-extending interconnection engages said radially-extending second and third abutment surfaces and thereby accurately and repeatably positions the specimen in the sweet spot of the imaging field so as to enable optimum repeatable imaging of the specimen.

23. (new) The system of claim 22, wherein said first abutment surface comprises a radially-extending flange.

24. (new) The system of claim 22, wherein said specimen positioning assembly further comprises a specimen chamber, and wherein said retention device is located in said specimen chamber.

25. (new) The system of claim 22, wherein said positioning assembly further comprises a gradient coil locator plate axially spaced from said first abutment surface and configured to position a gradient coil within the axial bore of the imaging machine.

26. (new) The system of claim 22, wherein said positioning assembly further comprises a probe coil spacer plate axially spaced from said first abutment surface and configured to position a probe coil within the axial bore of the imaging machine.

27. (new) The system of claim 22, wherein said first, second and third abutment surfaces are located at predetermined axial positions upon abutment of said second and third abutment surfaces.

28. (new) The system of claim 22, wherein said first and second abutment surfaces are located externally of said axial bore.

29. (new) The system of claim 22, wherein said interconnection comprises a self-centering interconnection.

30. (new) A specimen positioning system for use with an imaging machine having an imaging field, comprising:

a positioning assembly mountable in a fixed position on said imaging machine;

a specimen positioning assembly removably, accurately and repeatably mountable in a predetermined position against said positioning assembly;

a specimen tube mounted on said specimen positioning assembly, said specimen tube having an internal chamber for holding a specimen;

a specimen retention device provided in said internal chamber and constructed to hold a specimen in a fixed position within said chamber;

a releasable interconnection provided between said positioning assembly and specimen positioning assembly, wherein movement of said specimen positioning assembly along said interconnection is axially limited at a predetermined axial position such that

placement of the specimen positioning assembly into the positioning assembly along said interconnection up to said predetermined axial position locates the specimen within the imaging field of the imaging machine.

31. (new) The system of claim 30, further comprising a fluid fitting on said specimen positioning assembly and in fluid communication with said chamber.

32. (new) The system of claim 30, wherein said specimen positioning assembly further comprises an access door allowing insertion and removal of the specimen into and out of said chamber.

33. (new) The system of claim 30, wherein the specimen retention device comprises ear bars insertable into the specimen's ears.

34. (new) The system of claim 30, wherein said interconnection comprises a sliding interconnection.

35. (new) The system of claim 30, wherein said specimen positioning assembly further comprises an engagement member and wherein said movement of said specimen positioning assembly is axially limited by said engagement member.

36. (new) The system of claim 35, wherein said positioning system further comprises an engagement surface engageable with said engagement member such that abutment is effected between said engagement member and said engagement surface at said predetermined axial position.

37. (new) A specimen positioning system for holding a laboratory specimen within an imaging field in the bore of an imaging machine, comprising:

a positioning assembly fixed in position on the imaging machine, said positioning assembly comprising a boss portion dimensioned to form a close fit against and within the bore of the imaging machine to center and support the positioning system against and within the bore of the imaging machine;

a specimen positioning assembly removably mountable to the positioning assembly, said specimen positioning assembly comprising a specimen holder; and

an interconnection provided between said positioning assembly and said specimen positioning assembly and comprising an abutment limiting axial movement of said specimen positioning assembly along said positioning assembly at a predetermined axial location such that a specimen held in said specimen holder is located within the imaging field when movement of said specimen positioning assembly is limited at said predetermined axial location.